on β Lyræ before the Royal Institution in 1904 will be remembered. His photographic work in stellar spectroscopy was awarded a gold medal in the St. Louis Exposition of 1904, and a *grand prix* by the Franco-British Exhibition of 1908.

At Stonyhurst, Sidgreaves also, in his younger years, taught mathematics and chemistry, and, as a priest, physics, to the students of St. Mary's Hall for twenty-five years with great success. Everyone who came in contact with him was attracted by his kindly and amiable disposition. He effaced himself that others might have more time for research work. He was elected a Fellow of the Royal Astronomical Society in 1891, and served for many years on its council.

NOTES.

MANY subjects of importance are to be discussed at the meeting of the International Research Council, to be held in Brussels on July 18–28. It may be remembered that the council arose out of Inter-Allied conferences held in London and Paris last year (see NATURE, December 26, 1918). Steps are to be taken at Brussels to establish the federation in its final form. The statutes of the council are to be discussed and also those of international unions of astronomy, physics, mathematics, geodesy and geophysics, and other departments of science. There will be a report of a committee on international co-operation in chemistry, and one on the foundation of the federation of societies of pure and applied chemistry. The important question of the biological exploration of the North Sea and North Atlantic Ocean will also be brought forward. The executive committee, consisting of MM. Picard (chairman), Volterra, Lecointe, Hale, and Schuster, acting upon the views expressed at the conference held in Paris in November last, has unanimously decided to recommend to the council that the following nations, which were neutral during the war, be invited to co-operate:—Denmark, Spain, Holland, Monaco, Norway, Sweden, and Switzerland. It is suggested also that Czecho-Slovakia and Finland should be considered as possible co-operating nations. The executive committee was appointed as a temporary body only, entrusted with the duty of bringing forward proposals at Brussels, and promoting the formation of national councils, the federation of which will form the International Council. It may be dissolved when the International Council is finally constituted.

IN the first issue of the *Crucible*, a magazine recently started by the science students of the University of Aberdeen, there is a characteristically trenchant article by Prof. Soddy. Under the metaphor of new wine into old bottles, Prof. Soddy points on one hand to the praiseworthy labours of the junior staffs in our universities in carrying to a high degree of efficiency the teaching of experimental science to thousands of eager students, and on the other to lack of prevision on the part of the authorities in encouraging research. It is safe to say, indeed, that the conservative instincts of the governing bodies, many members of which have not the least conception of what is meant by scientific research, tend rather to discourage than to encourage the hard-worked assistants from engaging in any form of research work. Even the Carnegie Trust for the Universities of Scotland, one of the primary objects of which was to promote scientific study and research, has expended out of its millions only some 14 per cent. on research of all kinds, including historical, linguistic, and economic subjects. According to Prof. Soddy, the *loss* on the money saved, occasioned by the depreciation of British investments during the war, would have maintained several first-class research professorships since the Trust was founded. In short, how can science as a progressive factor in civilisation get a fair chance in ancient institutions largely governed by medieval conceptions? This is virtually Prof. Soddy's complaint; and it is one calling for serious reflection and strenuous endeavour on the part of all who have the welfare of the nation at heart.

A RELIEF expedition under Capt. Godfred Hansen, of the Danish Navy, has left Copenhagen to place a depôt of stores for Capt. Roald Amundsen in Grant Land. Capt. Hansen, who in 1903–5 was second-in-command of Amundsen's expedition in the *Gjoa*, has, according to the *Morning Post*, sailed in a Danish Government vessel for Upernivik, in Greenland. In July he hopes to reach North Star Bay in lat. 76° N., where he and his party will winter. In the spring they will start north, taking Eskimo with them, and will travel *via* Cape Morton and Kennedy Channel to Fort Conger, Greeley's quarters from 1881 to 1883. The majority of the party will remain at Fort Conger and engage in hunting, while the leader and one other man will push on to Cape Columbia, a distance of about six hundred miles, in order to leave a year's rations, together with guns and ammunition and a detailed description of the route by Knud Rasmussen, the Danish explorer of North Greenland. Returning to Fort Conger, Capt. Hansen and his men will leave for Greenland in the autumn as soon as Kennedy Channel freezes. It is most improbable that Capt. Amundsen in the *Maud* will reach Grant Land next summer, since his drift across the polar basin will probably occupy at least three years, but in the event of his ship being crushed, the depôt will be invaluable. In any case, it will serve him well in the course of time, unless the *Maud* is carried east of Greenland.

ONE result of the war has been that the tendency in Germany is more and more in the direction of co-operation. From two recent translations which Sir Robert Hadfield has had prepared, to whom we are indebted for copies, we note that the technologists of Germany are convinced that technical interests can only be furthered by combination. The union of technical men was formed so long ago as last December, with the support of most of the German technical societies, for the purpose of securing for the technologist that recognition of his importance which has apparently been denied him hitherto. The new body seems to have been primarily inspired as an offset to the pernicious and undermining influence of certain groups who are trying to gain the ascendency in Germany. In the propaganda publication the Union states that a technical expert succeeded in saving some 20,000 tons of coal a month in an explosives factory without diminution of output. Another body to be formed is the German Empire Industrial League, which is a combination of existing groups, and will embrace an organisation styling itself the Joint Executive of Employers and Employed. It is hoped that all industrial interests will find expression in this new body.

WE regret to learn that official information has been received that the Cape Provincial Council, Cape Town, has decided to exterminate the herd of elephants in the Addo Bush Reserve. With the exception of a small herd in the Knysna Forest, these are the last survivors of the wild South African elephant. The animals in the Addo Bush Reserve have become a source of danger and damage to the surrounding farms. By breaking down fences and destroying waterworks, and generally bringing about a state of terror and insecurity, they are the cause of actual damage to a serious extent. They hamper farming operations and agricultural development. Nevertheless, the drastic step that has now been decided upon cannot fail to arouse considerable dissatisfaction in the sporting and scientific world.

WE have received a copy of a proposal endorsed by many well-known scientific men for the establishment of an institute of commercial and industrial psychology and physiology. The proposal is accompanied by a summary of thirty investigations in which the scientific analysis of industrial movements resulted in a notable improvement of output, and reference is also made to the effects of shorter hours and the introduction of rest pauses. Amongst the scientific supporters of the proposals are Sir Walter Fletcher, Mr. W. B. Hardy, Lt.-Col. Myers, Prof. C. S. Sherrington, and Prof. E. H. Starling. The secretary is Mr. G. Spiller, 1 Great Tower Street, E.C.3.

MR. F. FLIPPANCE, at one time a temporary assistant in the herbarium at Kew, has been appointed assistant curator of the Botanic Gardens, Singapore.

THE Guy medal of the Royal Statistical Society for 1918–19 has been awarded to Dr. J. C. Stamp, who recently contributed papers to the society on "The Effect of Trade Fluctuations on Profits" and "The Wealth and Income of the Chief Powers."

A DIRECTOR of research is about to be appointed, at a salary of not less than 1250*l*. per annum, by the British Cotton Industry Research Association, 108 Deansgate, Manchester. Forms of application and further information are obtainable from the secretary of the association. The latest time for receiving applications for the post is July 21.

THE council of the Royal Society of Edinburgh has awarded the Makdougall-Brisbane prize for the period 1916–18 to Prof. A. Anstruther Lawson, of Sydney, for his memoirs on the prothalli of *Tmesipteris tannensis* and of *psilotum,* published in the Transactions of the society, together with previous papers on cytology and on the gametophytes of various gymnosperms.

AT the meeting of the Franklin Institute, Philadelphia, held on May 21, the Franklin medal awarded to Sir James Dewar was received by Major-Gen. J. D. McLachlan, representing the British Government, and the presentation of the Franklin medal to Major-Gen. George Owen Squier, U.S. Army, was also made. An address was given by Major-Gen. Squier on "Some Aspects of the Signal Corps in the World-War."

THE sixth lecture of the series arranged by the Industrial Reconstruction Council will be held in the Saddlers' Hall, Cheapside, E.C.2, on Wednesday, June 25. The chair will be taken at 4.30 p.m. by the Right Hon. J. H. Whitley, and a lecture will be delivered by the Right Hon. C. W. Bowerman on "Some Industrial Problems." Applications for tickets should be made to the Secretary, I.R.C., 2 and 4 Tudor Street, E.C.4.

THE annual general meeting of the Society of Chemical Industry will be held in London on July 15–18, under the presidency of Prof. Henry Louis. On Tuesday, July 15, there will be a conference at the Mansion House, when addresses will be given by representatives of the Inter-Allied Conference. Sir William J. Pope, chairman of the Federal Council for Pure and Applied Chemistry, will open the conference. The subjects of other conferences will be:—Power Plant in Chemical Works; Empire Sugar Production; Dyestuffs, Synthetic Drugs, and Associated Products; The Chrome Tanning Industry; and Recent Developments in the Fermentation Industries. A reception will be held at the British Scientific Products Exhibition, Central Hall, Westminster, on July 17.

THE New Zealand Department of Lands issued in 1918 a report on the "Waipoua Kauri Forest: Its Demarcation and Management." This forest, which has recently been demarcated by Mr. D. E. Hutchins, was made a national reserve under the State Forests Act of 1908. It covers 29,830 acres, and contains a large number of old and giant trees of Kauri, *Agathis australis,* an endemic conifer yielding a very valuable timber. The forest is in a wild state, bringing in no revenue at present. Mr. Hutchins recommends a system of management by which the old trees would be speedily felled and a young, regular growth established, which in course of time would yield an enormous revenue. The Government owns five other Kauri forests, each averaging 12,000 to 15,000 acres. As there are estimated to be about 500,000 acres of restorable Kauri forest altogether, it is desirable, perhaps, in the interests of science and of scenic beauty, that one of the five Government forests, or a portion of one, should be left in its natural state, with a fair number of the oldest trees untouched, in spite of the temptation to realise the money worth of all the finest timber.

THE North-East Coast Institution of Engineers and Shipbuilders will hold a summer meeting, which is being called the Victory Meeting, on July 9–11 in Newcastle. The meeting is the first of the kind it has held since July, 1914, when, on the eve of the war, the institution received the Institution of Naval Architects and the Institution of Engineers and Shipbuilders in Scotland at a joint meeting. Among the distinguished guests invited are Marshal Foch, Sir David Beatty, and Sir Douglas Haig, upon whom honorary fellowship of the institution will be conferred at the inaugural meeting. Papers recording the industrial work of the North-East Coast during the war will be read by Mr. A. H. J. Cochrane, Mr. M. C. James, and Mr. Launcelot E. Smith. Lady Parsons, who will receive the diploma of honorary fellowship during the proceedings, will address the meeting on "Women's Work in Engineering and Shipbuilding during the War." This will be the first occasion upon which a woman has delivered a paper before this institution. Other important papers will be read by Lord Weir of Eastwood, Lt.-Comdr. Wilkinson, Mr. Georges Constantinesco, and Prof. MacLennan. The two first-named authors deal with the subjects in which they are eminent experts: the development of aircraft during the war and thermal efficiency in Diesel and other internal-combustion engines. Comdr. Wilkinson will describe his work in the "dazzle-painting" of ships. Mr. Constantinesco will explain his new system of power transmission, and illustrate it by practical experiments. Prof. MacLennan has not yet named the subject of his lecture.

IT is well known that radiographers, if unprotected, are liable to injury by X-rays, such as "burns," intractable dermatitis which is liable to become cancerous, and sterility. Dr. Hernaman-Johnson in the Journal of the Röntgen Society (vol. xv., No. 59, p. 45) discusses the protective measures that should be taken in diagnostic work by radiographers. He recommends that (1) the tube should be entirely enclosed in a box opaque to X-rays, and (2) *scattered* radiations should be prevented from reaching the body of the observer. The measures to be taken to fulfil these conditions are discussed. True secondary radiation is not a danger except in the case of certain metallic articles worn close to the body, and then only if the precautions named are not efficiently carried out.

Bulletin 174 (May, 1918) of the Agricultural Experiment Station of the Rhode Island State College deals with the part played by bacteria of the paratyphoid group in the causation of disease in poultry. The authors (Philip Hadley, Marguerite Elkins, and Dorothy Caldwell) conclude that there are six principal disease types among the typhoid- and cholera-like diseases of birds:—(1) Fowl cholera, due to *B. avisepticus* of the Pasteurella group; (2) fowl typhoid, due to *B. gallinarum*, Klein, of the actual paratyphoid group; (3) paracolon infections, due to paracolon bacteria in the strict sense; (4) bacterial white diarrhœa, due to *B. pullorum* A; (5) infections in adult stock with *B. pullorum* B; and (6) infections with certain intermediate strains. The report succeeds in elucidating the bacteriology of several poultry diseases about which much confusion formerly existed.

The World Trade Club, of San Francisco, has circulated widely copies of a letter addressed by the club to Lord Balfour of Burleigh, advocating the immediate introduction of the metric system of weights and measures in the United Kingdom. The letter points out that both Great Britain and the United States were obliged to make use of the metric system in foreign countries during the war, and urges that the adoption of the "meter-liter-gram" system is absolutely necessary in the interests of education and business, and of our foreign trade in particular. Recipients of the letter are requested to sign and dispatch the printed forms at the end, addressed to Mr. Lloyd George and President Wilson respectively, calling for legislation to bring about the exclusive use of the system in this country and in the United States.

In the Journal of the Bihar and Orissa Research Society (vol. iv., part iii., September, 1918) Dr. W. Crooke describes a remarkable form of headdress worn by women of the Banjara tribe, wandering carriers in northern India and the Deccan. It consists of a stick or "horn" made of wood or silver, which is placed upright on the top of the head, the hair being wound round it, and over it the headcloth is draped in a graceful fashion. Numerous analogies to this form of headdress are traced in Central Asia, Assyria, among the Druses, and in ancient Indian statuary. It seems to be a mark of distinction, presumably confined to married women, and its use may ultimately depend upon the theory of the sanctity of the head. But, so far, the evidence from India does not fully corroborate this. The same is the case with the theory which would connect the Banjaras with some northern tribe, though it is possible that the Charan branch may have been priests of the Gurjaras, one of the many branches of the Hun tribes which invaded India in the fifth and sixth centuries of our era.

Messrs. A. N. Winchell and E. R. Miller (Amer. Journ. Sci., vol. xlvi., p. 599, and vol. xlvii., p. 133) describe a remarkable dustfall that occurred at Madison, Wisconsin, on March 9, 1918. Microscopic examination and mechanical analysis indicate that the material is not volcanic, but merely wind-borne, and was derived from rocks physically disintegrated in a very arid climate, probably from New Mexico or Arizona. It is pointed out that a single storm may thus "transport a million tons of rock material a thousand miles or more."

Mr. S. S. Buckman, in a paper entitled "Jurassic Chronology: I.—Lias" (Quart. Journ. Geol. Soc. London, vol. lxxiii., p. 257, 1918), has made the most important contribution to our knowledge of Jurassic strata in the Inner Hebrides since Judd's work of forty years ago. The paper, with Mr. J. W. Tutcher's appendix on zonal sequence in the Lower Lias, covers also a wider field, and the discussion to which it gave rise shows that the gaps in the record suggested by the details of the palæontology were not immediately accepted by stratigraphers.

The Journal of the East Africa and Uganda Natural History Society for November, 1918 (Longman, London, price 5*s.* 4*d.*) contains an account by Mr. C. W. Hobley of a volcanic eruption of Donyo L'Engai, a mountain in the trough-valley about forty miles south of the Anglo-German boundary in East Africa. This outburst occurred in January, 1917, and appears remarkable for the amount of sodium carbonate thrown out with the volcanic dust over a wide area. Mr. Hobley goes back to the old theory that metallic sodium may be a cause of volcanic eruptions; but the presence of Lake Natron a few miles to the north makes it possible that Donyo L'Engai was built up above the deposits of similar saline waters, which were blown up with the volcanic matter from below.

Prof. Filippo Eredia has published an instructive paper on the climate of Gorizia in a recent issue of the *Bollettino Bimensuale* of the Meteorological Society of Italy. Gorizia is in lat. 45° 56′ N., long. 13° 37′ E., and meteorological observations have been maintained since 1870, which are discussed for the forty-five years ended 1914. The mean annual temperature is 12·7° C. (54·9° F.), the average varying from 22·8° C. (73·1° F.) in July to 2·8° C. (37° F.) in January. Pressure falls to a minimum in April, when cloud amount is highest, and is at a maximum in January. August is the sunniest month, with 63 per cent. of the total possible against 41 per cent. in April. The mean annual rainfall is 1595 mm. (62·8 in.), with extremes of 200 mm. (7·87 in.) in October and 70 mm. (2·76 in.) in January. The wettest month was October, 1889, with 497 mm. (19·57 in.), and in the Januaries of 1880 and 1888 and the Februaries of 1890 and 1891 no rain fell. Calms prevail for more than half the time, and north-east is the most frequent wind experienced in every month of the year. Snow falls on five days, hail on four days, and rain on 142 days annually. Thunderstorms are frequent, the mean annual number being twenty-eight, of which 60 per cent. occur in the three summer months. In a note entitled "Sulla Direzione delle Correnti Aeree in Sicilia," that appears in vol. xxvii. of *Rendiconti della R. Accademia dei Lincei*, Prof. Eredia gives an analysis of the monthly direction of the wind for nine places in Sicily based on observations from 1891–1910, the mean direction being obtained by Lambert's formula.

According to U.S. Commerce Report No. 85 (1919), a discovery of copper is reported from near Beaudoinville, a port at the southern end of Lake Tanganyika, Belgian Congo.

Bulletins Nos. 9 and 10 of the Advisory Council of Science and Industry for the Australian Commonwealth are just to hand. They deal respectively with the manufacture and uses of ferro-alloys and alloy steels from the raw materials in Australia, and with substitutes for tin-plate containers (tin cans). The latter is a specially interesting report, giving information as to the manufacture of wood and cardboard containers and of the machinery used, varnishes, the properties of the different materials, etc.

Booklets have reached us from the firm of Messrs. Adam Hilger, Ltd., describing the wave-length spectrometer introduced in 1904 and various accessories which may be employed in connection with the instrument. The constant deviation prism is rotated by means of a fine steel screw, to which is fixed a drum provided with a scale of wave-lengths. In the most recent instruments this scale is on the side of the drum towards the eye, so that the wave-lengths can be read without quitting the eyepiece. In one form of the instrument provision is made for the use of a Fabry and Perot etalon, by means of which wave-lengths may be determined to a very high accuracy, or for a Michelson echelon or a Lummer-Gehrcke parallel plate for demonstrating the Zeeman effect. Another development of great importance is the improved form of polarisation photometer, based on that described by P. G. Nutting, which, when used in conjunction with the constant deviation spectrometer, provides a powerful tool for spectro-photometry. The attention of the technical chemist may usefully be directed to this method of investigation, which has already proved of service in research on dyes and on photographic plates.

In a paper on "Electrical Phenomena occurring at High Levels in the Atmosphere," recently read before the Institution of Electrical Engineers, Dr. S. Chapman gives "a general outline of the subject, without detailed argument or references." "The account," he adds, "is not limited to what can be regarded as certain conclusions; without departing too far from the basis of observational evidence, conjectural views have also been admitted." Dr. Chapman seems finally to accept the Birkeland-Störmer theory as to the joint cause of magnetic storms and aurora being electrical ions discharged from the sun, but in opposition to Birkeland he thinks these must be α-rays, not cathode- or β-rays. During magnetic storms he accepts a highly ionised layer coming down to about 100 km. above the earth's surface. At a lower level he supposes normally existent a second conducting layer, its ionising agent being ultra-violet light, which he identifies with γ-rays. In it are the electrical currents to which the regular (solar) diurnal variation is ultimately due. Accepting as a fact that magnetic storms are not accompanied by special changes of electrical potential gradient at the earth's surface, it is supposed that the upper atmosphere is so good a conductor that the charge from the α-rays almost instantaneously distributes itself uniformly over a spherical surface, and so does not influence the electrical field at lower levels. The sudden rise and the subsequent slow decline of horizontal force characteristic of magnetic storms in low and mean latitudes are ascribed to vertical movements of the atmosphere, cutting the horizontal lines of the earth's magnetic field. "The general nature of the movement can be readily inferred. The mutual repulsion of the entangled charge spread over the world-wide spherical layer produces an upward, outward movement, as in a charged soap-bubble. Thus the air travels vertically upwards, except during the first few minutes of a magnetic storm. For at first the downward momentum of the injected particles depresses the air before the electricity has accumulated sufficiently to reverse the motion."

The possibilities of exploitation of the River Dee, from its source in Wales to the city of Chester, for the development of low-fall water-power, economically utilisable for the generation of electrical energy, is the subject of a recently issued report by Mr. S. E. Britten, arising out of a conference held in June, 1917, by the Board of Agriculture and Fisheries. The *Engineer* for May 30 contains a *résumé* of the report, from which we gather that Mr. Britten's scheme provides for sixteen power-stations at various points along the river's course, with falls generally ranging from $7\frac{1}{2}$ ft. to $12\frac{1}{2}$ ft. (there is one case of a 37-ft. fall), and capable of producing in the aggregate 60,000,000 electrical units per annum. The capital cost of the scheme is estimated at 702,240*l.*, and, with an average sale of about 48,000,000 units at $1\frac{1}{2}$*d.* per unit, a surplus balance of 205,468*l.* is counted upon. Included in the estimate are the sixteen hydro-electric stations at 29,700*l.* each, a tunnel at 60,000*l.*, and sixty-one miles of transmission line at 65,000*l.* The possibilities of the scheme for producing power are equivalent to a consumption of 70,000 tons of coal per annum. The valuable characteristics of the river for salmon-fishing have not been lost sight of. The quantity of fish caught annually is about 2500, with a gross weight of 13 tons, valued at 3750*l.* From six years' observation made in connection with the Chester Weir there is no evidence, according to the report, that the fish suffer in the least degree from the establishment of hydro-electric works.

The following books are announced for early publication:—"Menders of the Maimed: The Anatomical and Physiological Principles underlying the Treatment of Injuries to Muscles, Nerves, Bones, and Joints," Prof. A. Keith; "Fractured Femurs: Their Treatment by Calliper Extension," Major M. G. Pearson and Capt. J. Drummond (*H. Frowde and Hodder and Stoughton*); "Psychology and Parenthood," H. A. Bruce (*W. Heinemann*); "Our Atlantic Flight," H. G. Hawker and Lt.-Comdr. M. Grieve, with an introduction by Major-Gen. J. E. B. Seely (*Methuen and Co., Ltd.*); "Opportunities in Chemistry; or, Chemistry in Everyday Life," E. Hendrick (*University of London Press*); and "Senior Practical Chemistry," H. W. Bausor (*University Tutorial Press, Ltd.*). The following works are in the press for publication by the *Carnegie Institution of Washington* (*Washington*):—"The Cactaceæ: Descriptions and Illustrations of Plants of the Cactus Family," N. L. Britton and J. N. Rose, 4 vols.—vol. i., "The Ecological Relation of Roots," J. E. Weaver; "The Carbohydrate Economy of Cacti," H. A. Spoehr; "Climatic Cycles and Tree-growth," A. E. Douglas; "Plant Indicators: The Relation of Plant Communities to Conditions and Practices," F. E. Clements; and "Hydration and Growth," D. T. MacDougal.

The price of Norton's "Star Atlas," noticed in Nature of June 12, was incorrectly given as 3*s.* 6*d.* The publishers ask us to point out that the selling price of the book is 8*s.* 6*d.*

OUR ASTRONOMICAL COLUMN.

The Solar Eclipse of May 29.—We have received through the office of the Scientific Attaché of the American Embassy the following message from Dr. L. A. Bauer, director of the Terrestrial Magnetic Laboratory of the Carnegie Institution of Washington, referring to observations of the total solar eclipse of May 29:—"Cape Palmas.—Complete success; inner corona very bright, marked outer corona extensions S.S.E., N.N.W.; brilliant red prominence W.S.W.; several stars seen region sun; no shadow bands; magnetic effect confirmed."